Operation & Maintenance Manual

Compressor Welder Generator Unit ADE015759

Truck-based CWG

AUSTRALIAN DIVERSIFIED ENGINEERING PTY. LTD.

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1 General Information

This guideline provides all the necessary information to operate and maintain the Compressor Welder Generator (CWG) unit supplied by Australian Diversified Engineering. Use this information in conjunction with the Olympian OEM information and mine site instructions where applicable.

Refer to the Parts Manual for part information when sourcing replacement parts. The serial number of the CWG unit, found on the ID plate, may be required to determine appropriate parts.

Refer to Section 3.1 in this manual for further information on the location of the ID plate.

Whenever a question arises regarding the information contained within this manual please consult Australian Diversified Engineering Pty Ltd for the latest available information. Selected manuals may be found at www.ade.net.au containing the most up to date information for the product.

2 Safety

2.1 Important Safety Information

Safety precautions and warnings may be listed in this manual and applied to the product (supplied by Australian Diversified Engineering) in the form of safety signs and labels.

Safety signs and labels may be positioned on specific parts of the product to draw attention to objects and situations affecting health and safety. If these hazard warnings are not heeded, bodily injury or death may occur to you or other persons.

The severity of the consequences of the hazard may be easily identified by the alert symbol at the top of the label.

The ***DANGER*** alert symbol is used to warn of a hazardous situation that is likely to be life threatening. Ensure you are aware of situations and locations on the product displaying this alert symbol.

The ***WARNING*** alert symbol is used to warn of a hazardous situation that is not likely to be life threatening. Ensure you are aware of situations and locations on the product displaying this alert symbol.

The wording given underneath the ***DANGER*** or ***WARNING*** alert symbol will warn of the hazard, the consequences of the hazard followed by information on how to prevent the hazardous situation from occurring.

Some signs placed on the product or machine (which do not contain a safety alert or symbol such as Danger or Warning) are to indicate that an instruction must be carried out. The label will contain black text on a white background. Read and obey the information contained on these labels.

The ***NOTICE*** heading may be contained within this manual and is used to highlight or alert to certain aspects of the product. Commonly the ***NOTICE*** heading is used to highlight the weight of an object or some other form of specific information applicable to the task to be performed.

Australian Diversified Engineering cannot anticipate all possible hazards. For instance, some hazards may be specific to your workplace or the equipment or tool you employ to complete the task.

Plan the job before proceeding. Planning before commencement of the job will help identify possible hazards in the job procedure which can be eliminated or controlled.

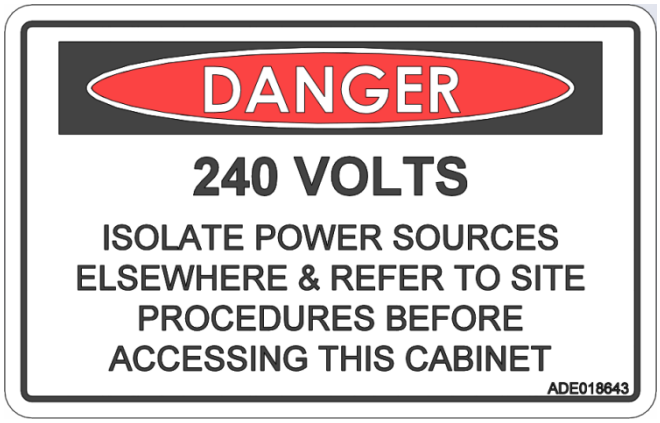
Be aware of unintended movement when assembling and disassembling components and ensure machines are isolated in accordance with workplace and supplier instructions when performing maintenance.

Ensure items are installed properly and are not damaged during the installation procedure or during operation of the machine. If damaged or installed incorrectly the product may not operate and perform as intended and may be made unsafe as a result. Ensure all items are repaired or replaced and care is taken when installing items on the machine.

Operate and maintain the machine in accordance with procedures specified by the original equipment manufacturer and information contained within this manual.

2.2 Safety Signs & Labels

There are several specific safety signs specific to the service vehicle. Their exact location and description of the hazard are reviewed in this section. Make sure that you can read all safety signs. You must replace a label if it is damaged, missing or cannot be read. If a label is on a part that is replaced, make sure a new label is installed on the replaced part. Contact Australian Diversified Engineering for replacement labels.

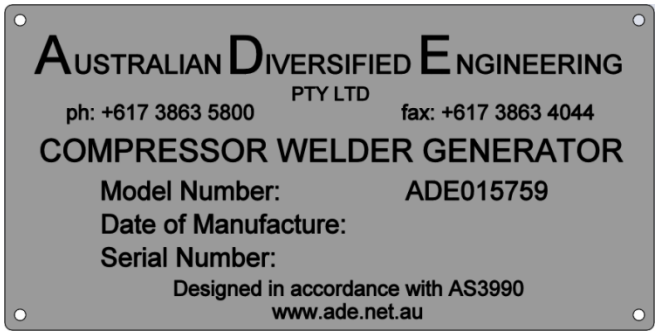


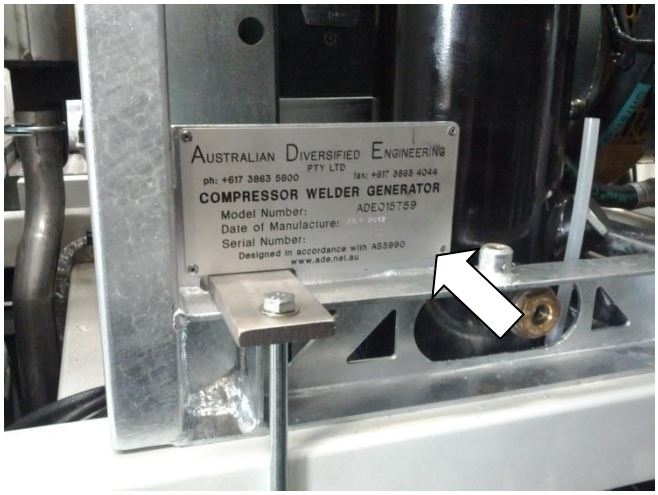
This sign is located on the top of the electrical cabinet

3 Product ID Information

3.1 Unit ID Plate

An ID plate has been fitted to each machine to indicate information such as the date of manufacture and serial number. Refer to the fitted ID plate for further information.





ID plate affixed near the oil separator tank

4 CWG Equipment

4.1 Caterpillar/Perkins Engine

The CWG is driven by a Perkins 403D-11G engine. The engine is a inline 3 piston diesel engine, governed at 1500 RPM. The engine is fueled the truck's diesel tanks, and is operated from the control cabinet.

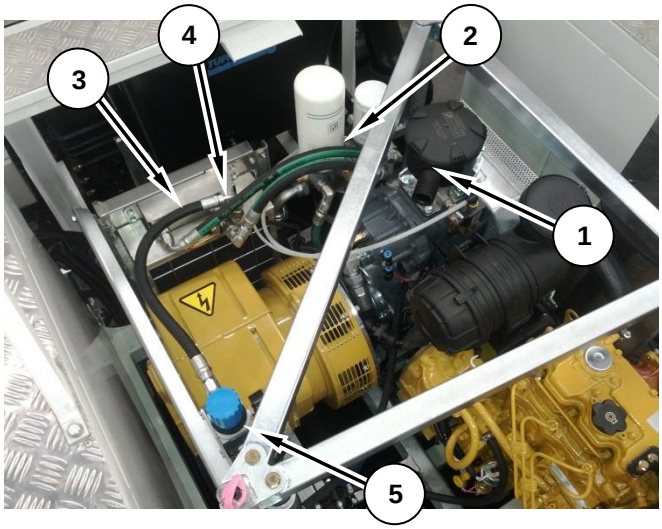
4.2 Alternator

The alternator used in the CWG provides 7.5 kVA of single phase 240 V AC electricity. Alternator status information and output power points are provided by the control cabinet.

4.3 Air Compressor System

The CWG is equiped with a 40 CFM air compressor system, which is controlled and monitored at the control cabinet. The system consists of the following components:

1. Air end
2. Oil separator tank, with:
    - Oil filter (small can)
    - Separator/De-oiler filter (large can)
3. Oil cooler
4. Air cooler
5. Air filter/water sepator regulator



4.4 Kempi Welder

The CWG unit will also be provided with Kemppi Miniarc EVO 150 portable MMA welder. The Kemppi provides up to 140A of welding current.

4.5 Control Cabinet

All CWG functions are controlled and monitored from the control cabinet, fitted in the rear driver's side cabinet. Functionality available includes:

- Start and stop the engine
- Monitor the engine's oil pressure, RPM and operating hours.
- Monitor the alternator's voltage, frequency and output current.
- Start and stop the air compressor system.
- Monitor the air compressor systems status, air pressure and operating hours.

5 Operation of CWG

Ensure you are familiar with the functionality, operation and all warnings associated with this equipment before attempting any form of operation.

5.1 Basic CWG Operation and Monitoring

To start the CWG:

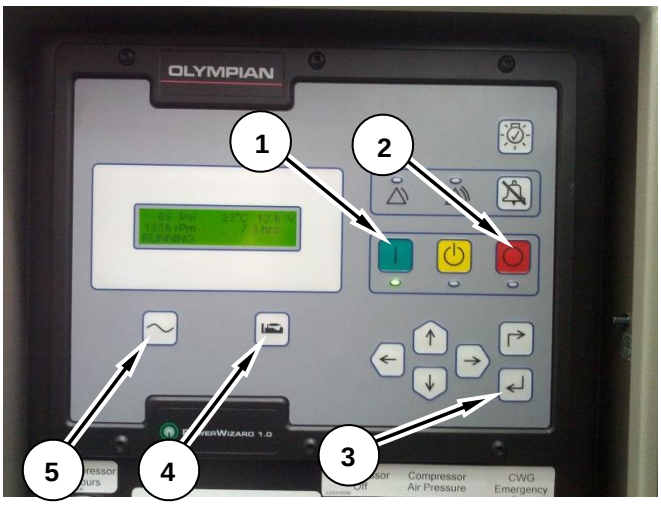
1. Check all personnel are clear of the CWG unit.
2. Press the Engine Start button (1).
3. The unit will move through a pre-start sequence, then crank the engine.

To stop the CWG:

1. Push the Compressor Stop switch, if running (see over page)
2. Press the Engine Stop button (2).
3. The unit will run a cool down sequence, then cut the engine.
4. To cancel the cooldown sequence, press and hold the Engine Stop button, then press the return button (3).
5. In case of emergency, press the CWG Emergency Stop button (see over page). This should only be done in an emergency situation as it bypasses the engine's cooldown sequence.

Monitoring the CWG:

- Pressing the Engine Monitoring button (4) displays the engine oil pressure, RPM and operating hours.
- Pressing the Alternator Monitoring button (5) displays the alternator voltage, frequency and current draw.



5.2 Utilising the 240V AC

The 240V AC power can be utilised at any time that the CWG is running. However, to prevent stalling the engine, the air compressor will be shut down at high current draw (approximately 6A). At extremely high current draw (20A), the clutch will also be disengaged.

5.2.1 Operating the Kemppi Welder

Due to the high yet intermittant current draw of arc welding, it is recommended that the the air compressor be switched off and clutch disengaged before welding commences. Operating the air compressor while welding may adversely affect the longevity of the clutch.

5.3 Air Compressor Operation and Monitoring

To start the air compressor:

1. Check all personnel are clear of the CWG unit.
2. Press the Compressor On button.
3. The clutch will engage immediately, and the compressor load valve will operate approximately 30 seconds afterward.
4. The compressor load valve will be modulated to keep air pressure within an acceptable range.

To stop the air compressor:

1. Push the Compressor Off switch.
2. The compressor will unload immediately, but the clutch will remain engaged for several minutes in order to cool the compressor oil. The CWG must left running during this time (cooldown cycle is acceptable).

Monitoring the air compressor:

- The Compressor Air Pressure gauge displays the air pressure available in the reservoir.
- The Compressor Hours gauge tracks the air compressor's hours of operation.
- The compressor's filter/regulator must be set at 110 PSI or higher, otherwise compressor activation will cause the engine to stall. If lower pressure regulation is required, a separate regulator must be used at the air outlets.

5.4 Compressor Overtemperature

The air compressor is protected by an over temperature switch. If the compressor outlet reaches 105 °C the switch will shut down the compressor and prevent it from restarting until it cools to 90 °C.

Possible causes:

1. Cooler filter element may be blocked.
2. Low compressor oil level.

5.5 Generator Has Priority

If the generator and compressor are running at the same time, the generator takes priority when undergoing a large current draw:

- Above 6A – The compressor is unloaded, clutch remains engaged.
- Above 20A – The compressor is unloaded, clutch is disengaged.

When underaking tasks with intermittant but high current draw, such as welding, it is recommended that the compressor is switched off to prevent excessive cycling of the clutch.

6 Maintenance Section

⚠ WARNING

Unintended machine movement may result in personal injury or death. Before performing maintenance on this machine ensure it has been isolated in accordance with mine site and manufacturer procedures and a Do Not Start Tag has been applied in the appropriate location on the machine.

NOTICE

You must read and understand the warnings and instructions contained in the Safety Section of this manual, before performing any maintenance procedures.

6.1 General Hazard Information

Perform all maintenance unless otherwise specified as follows:

- The vehicle parked on level ground.
- The engine and CWG stopped.
- The start switch key off and the key removed.
- All disconnect switches locked out and a Do Not Start Tag applied.
- Pressure relieved in the system which is to be serviced.
- All other external energy sources disconnected from the machine.

6.1.1 Oils & Coolant

⚠ WARNING

Oils and coolant may be hot and under pressure. Before serving components on this vehicle ensure all pressure is relieved in the system and fluids have been allowed sufficient time to cool.

6.1.2 Crushing & Cutting Prevention

⚠ WARNING

Disconnection of hoses and removal of supporting pins and bolts of the service vehicle may result in unintended machine movement and/or release of stored energy. Personal injury or death may result. Before disassembly of any components of the service vehicle ensure that stored energy has been relieved and components are chocked/blocked to prevent unintended movement.

- Support equipment and attachments properly when working beneath them. Never attempt adjustments while the machine is moving or the engine is running unless otherwise specified.
- Stay clear of all rotating and moving parts.

6.2 CWG Maintenance Schedule

This schedule is based on the CWG operation hours, which are displayed on the Engine Monitoring screen of the CWG control panel.

Note – This maintenance schedule is indicative only. Please refer to Section 9 of the Olympian Operator and Maintenance Instruction Manual, and page 60 of the Perkins Operation and Maintenance Manual for detailed requirements and instructions.

6.2.1 When Required

- Engine – **Clean**
- Engine air cleaner element – **Clean/Replace**
- Fuel system – **Prime**
- Severe service application – **Check**

6.2.2 Daily

- Engine oil level – **Check**
- Engine coolant level – **Check**
- Driven equipment – **Check**
- Engine air cleaner service indicator – **Inspect**
- Engine air precleaner – **Check/Clean**
- Fuel system primary filter/water separator – **Drain**
- Walk-around inspection

6.2.3 First 100 Hours ONLY

- Gearbox oil – **Change/Flush**

6.2.4 Every 250 Hours (or weekly)

- CWG control system handling of electrical faults by simulating faults – **Test**
- Exhaust connections – **Check/Tighten**
- Electrical connections – **Check/Tighten**
- Belts – **Inspect/Adjust**
- Gearbox oil level - **Check**

6.2.5 Every 500 Hours (or 1 year)

- Fuel system filter – **Replace**
- Engine air cleaner Element – **Clean/Replace**
- Engine oil and filter – **Change**
- Hose and clamps – **Inspect/Replace**
- Radiator - **Clean**

6.2.6 Every 1000 Hours

- Belts – **Replace**
- Engine valve lash – **Inspect/Adjust**
- Gearbox oil - **Change**

6.2.7 Every 2000 Hours

- Alternator – **Inspect**
- Engine crankcase breather – **Replace**
- Engine mounts – **Inspect**
- Starting motor – **Inspect**

6.2.8 Every 3000 Hours

- Cooling system water temperature regulator – **Replace**
- Fuel injector – **Test/Change**
- Water pump – **Inspect**

6.2.9 Every 6000 Hours (or 3 years)

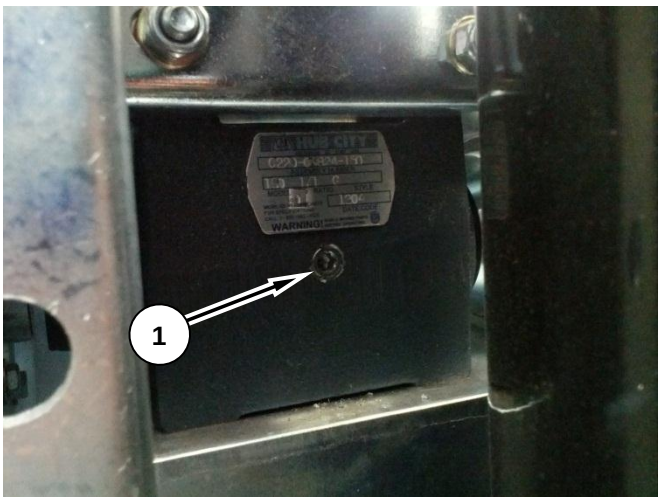
- Cooling system coolant – **Change (if Commercial Heavy-Duty)**

6.2.10 Every 12000 Hours (or 6 years)

- Cooling system coolant – **Change (if Extended Life Coolant)**

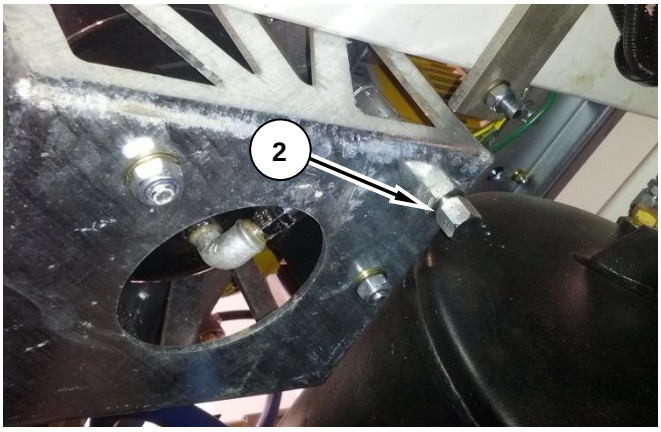
6.3 CWG Maintenance Tasks

Maintenance tasks not described here are detailed in Section 9 of the Olympian Operator and Maintenance Instruction Manual, and page 60 of the Perkins Operation and Maintenance Manual.



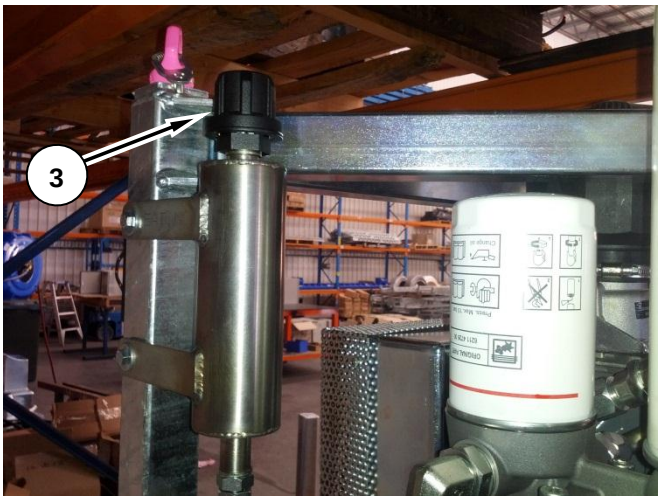
6.3.1 Checking the Gearbox Oil Level

1. Remove oil level inspection plug (1).
2. Check oil level via the oil level inspection hole. Oil level should meet the inspection hole, or be just under.
3. Replace the oil level inspection plug..



6.3.2 Changing the Gearbox Oil

1. Run the CWG up to operating temperature.
2. Shut down then isolate CWG and truck.
3. Undo oil drain cap (2).
4. Allow gearbox oil to drain into a container (a funnel may be required).
5. Replace oil drain cap.
6. Remove oil level inspection plug (1).
7. Remove breather (3) from the oil expansion tank, and pour approximately ***350mL*** of new gearbox oil into the tank.
8. Allow oil to drain into the gearbox.
9. Check oil level via the oil level inspection hole. Oil level should be filled to the level of the inspection hole. Fill more if required.
10. Replace the oil level inspection plug and the breather.



6.4 Air Compressor Maintenance Schedule

This schedule is based on the air compressor operation hours, which are displayed on the Compressor Hours gauge on the CWG control cabinet.

Note – This maintenance schedule has been adapted from Section 15 of the Compressor Unit OEM documentation, which should be referred to for further instructions.

6.4.1 Daily

- Walk-around inspection
- Check compressor oil level

6.4.2 Every 25 Hours

- Drain condensate from oil separator tank
- Clean cooler filter panel

6.4.3 Every 250 Hours

- Clean air suction filter
- Check belt tension

6.4.4 Every 1000 Hours

- Change the oil
- Change the oil filter
- Change the air suction filter

6.4.5 Every 2000 Hours

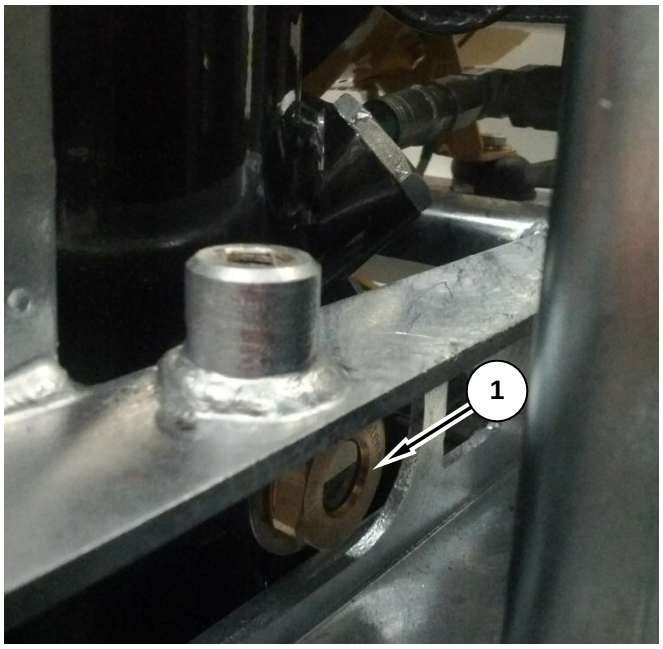
- Clean the finned surface of the oil and air coolers
- Change the oil separator/de-oiler filter

6.5 Air Compressor Maintenance Tasks

Maintenance tasks not described here are detailed in Section 15 of the Compressor Unit OEM documentation.

6.5.1 Checking Compressor Oil Level

1. Switch off the air compressor.
2. Wait a few minutes for the foam in the separator tank to subside.
3. Check fluid level is visible on the sight glass (1). The minimum fluid level is at the bottom of the sight glass, while the maximum is at the top of the sight glass.
4. If the oil level is below the minimum, top up.



6.5.2 Draining Condensate from Oil Separator Tank

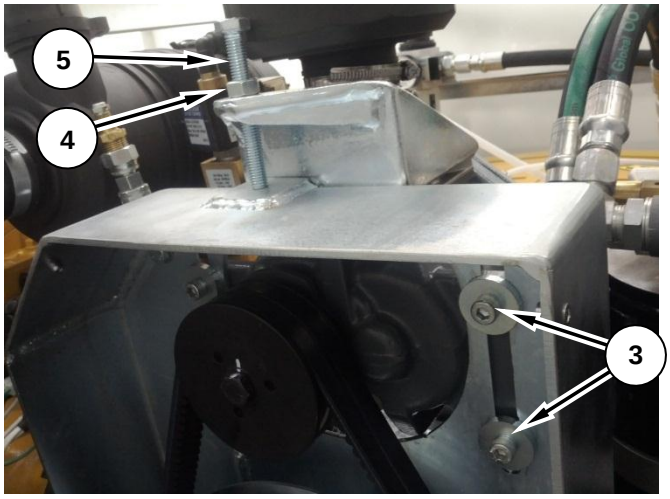
1. Ensure CWG and truck are shut down and isolated.
2. Wait for the machine to cool down.
3. Slowly turn on the tap (2) and let the condensate flow out.
4. When the first traces of oil appear, turn off the tap.

6.5.3 Cleaning the Air Suction Filter

1. Ensure CWG and truck are shut down and isolated.
2. Remove filter cover (2).
3. Remove the filter.
4. Clean the filter with a jet of air, working from inside to outside. **DO NOT USE WATER OR SOLVENTS**. Alternatively, fit a new filter.
5. Clean the disk on which the filter rests with a clean cloth.
6. Fit the filter and the cover.

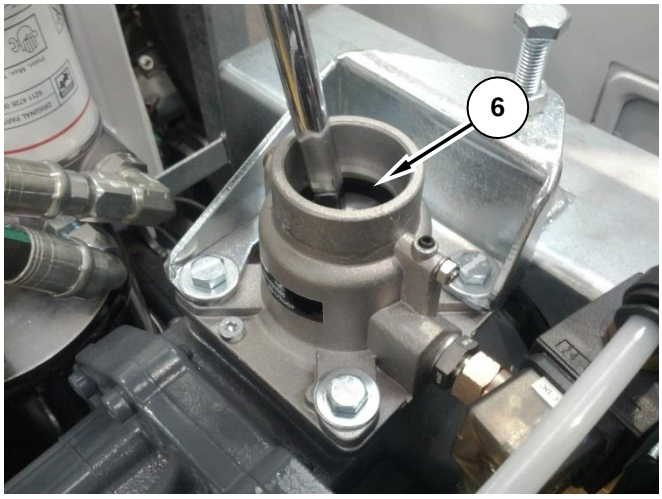
6.5.4 Belt Tension

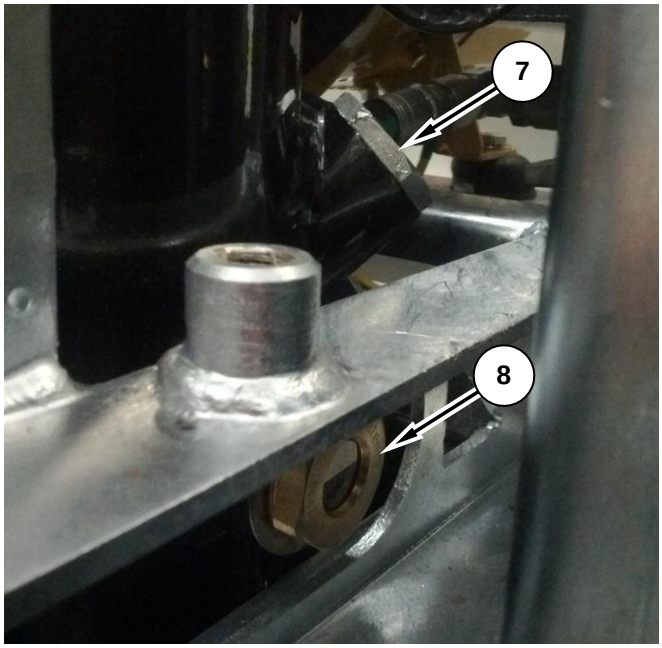
1. Ensure CWG and truck are shut down and isolated.
2. Remove the belt guard.
3. Slacken the air end screws by half a turn (3).
4. Loosen the locknut (4).
5. Adjust the tension by turning screw (5).
    a. New belt - deflection should be 6mm for a 4kg force applied at the centreline, at right angles to the belt.
    b. 100 hrs Operation - deflection should be 2mm for a 2.5kg force applied at the centreline, at right angles to the belt.
6. Tighten the locknut.
7. Tighten air end screws.
8. Replace belt guard.



6.5.5 Changing the Oil

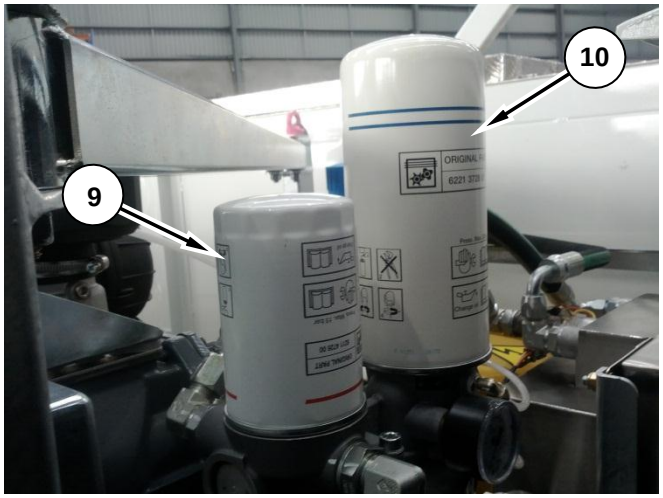
1. Ensure CWG and truck are shut down and isolated.
2. Oil should be changed while machine is warm (i.e. right after operation)
3. Drain oil from oil separator tank via the tap (see Section 1.1.1). Close tap.
4. Remove air suction filter housing and pour ***1L*** of oil slowly down the neck (6), while cycling the compressor by using a ratchet on the compressor pulley **(note pulley bolt is reverse thread)**. Ensure that the oil is being pumped out of the air end, or else the air end may be damaged.
5. Open oil fill plug (7).
6. Add approximately ***2.5L*** of oil to the tank. The tanks should be full according to tank sight glass (8). Fill more if required.
7. Replace oil fill plug.
8. Start the compressor and run for approximately 1 minute. Re-check oil level and add/remove more if necessary.





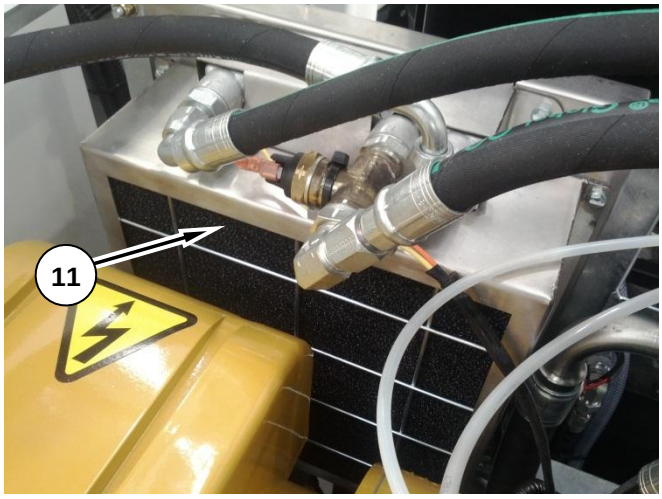
6.5.6 Replacing the Oil Filter and Separator Filter

1. Ensure CWG and truck are shut down and isolated.
2. Before removing the oil filter (9), or separator/de-oiler filter (10), ensure that there is no stored pressure in the reservoir.
3. Remove desired filter.
4. Lubricate new filter seals with a little oil before fitting.
5. Tighten new filter by hand.



6.5.7 Cleaning the Filtering Panel

1. Ensure CWG and truck are shut down and isolated.
2. Remove filtering panel (11) from cowling via slot.
3. Clean filtering panel with a jet of air and wash with water. **DO NOT USE SOLVENTS.**
4. Reinstall the filtering panel via slot, and adjust from the front to ensure it sits correctly.



6.6 Consumables for Maintenance

The following consumables required by the CWG are available for order from ADE.

Part	**Part Number**
Gearbox oil	ADE018575
Air compressor oil	ADE018547
Air compressor oil filter	ADE018548
Air compressor oil separator filter	ADE018549
Pre-cooler filtering panel	ADE018207
Belt	ADE017854

7 Literature Reference Materials

7.1 Olympian Generator Documentation

The Olympian generator documentation has been provided with the CWG.

7.2 Air Compressor System Documentation

The CSA 10 air compressor documentation has been provided with the CWG.